# Human Anti-Bacteria & Toxins Antibody ELISA Kits

Catalog # 6113-6128

*For Research Use Only - Not Human or Therapeutic Use*

## PRODUCT SPECIFICATIONS

| | |
|---|---|
| DESCRIPTION: | ELISA kit to quantify human anti-bacteria and toxin IgG and IgA antibodies |
| FORMAT: | Pre-coated 96-well ELISA Plate with removeable strips |
| ASSAY TYPE: | Indirect ELISA |
| ASSAY TIME: | 4.5 hours |
| STANDARD RANGE: | 32 units/ml to 0.5 units/ml |
| NUMBER OF SAMPLES: | Up to 40 (duplicate) diluted samples/plate and up to 20 (duplicate) low dilution samples/plate |
| SAMPLE TYPES: | Serum and Plasma |
| RECOMMENDED SAMPLE DILUTIONS: | 1:1000 (at least) |
| CHROMOGEN: | TMB (read at 450 nm) |
| STORAGE: | -20°C |
| VALIDATION DATA: | 6113: Intra-Assay (3.2-7.2%)/Inter-Assay (3.7-6.5%)/Spiking Test (95-109%) |
| | 6114: Intra-Assay (3.3-8.8%)/Inter-Assay (4.2-9.8%)/Spiking Test (94-103%) |
| | 6115: Intra-Assay (1.2-4.7%)/Inter-Assay (6-9.8%)/Spiking Test (90-107%) |
| | 6116: Intra-Assay (1.1-5.3%)/Inter-Assay (2-10%)/Spiking Test (88-94%) |
| | 6117: Intra-Assay (2.5-8.8%)/Inter-Assay (5.8-9%)/Spiking Test (94-96%) |
| | 6118: Intra-Assay (1.1-8.9%)/Inter-Assay (4.5-9.9%)/Spiking Test (105-108%) |
| | 6119: Intra-Assay (1.9-7.3%)/Inter-Assay (6-9%)/Spiking Test (95-110%) |
| | 6120: Intra-Assay (3.3-9%)/Inter-Assay (1.5-10.9%)/Spiking Test (89-91%) |
| | 6121: Intra-Assay (1.3-7.3%)/Inter-Assay (4.4-9.2%)/Spiking Test (92-98%) |
| | 6122: Intra-Assay (0.6-6%)/Inter-Assay (6-9.4%)/Spiking Test (93-102%) |
| | 6123: Intra-Assay (1.2-8.9%)/Inter-Assay (1.7-8.9%)/Spiking Test (95-108%) |
| | 6124: Intra-Assay (3.5-7.3%)/Inter-Assay (4.3-9.7%)/Spiking Test (94-96%) |
| | 6125: Intra-Assay (4.2-8%)/Inter-Assay (4-7.8%)/Spiking Test (90-98%) |
| | 6126: Intra-Assay (2.9-4.9%)/Inter-Assay (4-8.4%)/Spiking Test (91-93%) |
| | 6127: Intra-Assay (1.9-7.5%)/Inter-Assay (6.5-8.3%)/Spiking Test (103-110%) |
| | 6128: Intra-Assay (5.8-9%)/Inter-Assay (3.4-9.8%)/Spiking Test (93-102%) |
| NOTES: | N/A |



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# Human Anti-Bacteria & Toxins Antibody ELISA Kits

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## INTRODUCTION

A growing body of research indicates an association between intestinal bacteria and autoimmune diseases. More specifically, dysbiosis or imbalance of intestinal bacterial flora may contribute to the pathogenesis of Rheumatoid Arthritis (RA), as indicated by many studies on intestinal microbes (1-5). Furthermore, recent studies have also suggested a possible link between RA and periodontal diseases caused by *Porphyromonas gingivalis* (*P. gingivalis*) and *Aggregatibacter actinomycetemcomitans* (*A. actinomycetemcomitans*) (6-9). Normally, intestinal bacteria do not affect the host's health, but under certain conditions, may overcome the host's defenses and exert pathogenic effects. Examples of these include immunosenescence, gastrointestinal disorders such as constipation and diarrhea, or other events such as physical and psychological stress (10-17). It is therefore important to consider these risk factors when studying the etiology of autoimmune diseases. Intestinal bacterial imbalance may increase the levels of pathogenic substances in the gastrointestinal lumen and high mucosal permeability may increase translocation of potential pathogenic agents into the circulatory system. Consequently, pathogens can overwhelm the host's defense functions and cause chronic health problems that can evolve into autoimmune disorders (18, 19).

To facilitate and promote studies that determine immune responses to environmental agents in humans, Chondrex, Inc. provides ELISA kits for assaying human serum antibodies against a variety of potential pathogenic and non-pathogenic environmental agents, of which all humans may be universally exposed to during their lifetime. For more information, please contact us at support@chondrex.com. These ELISA kits employ ChonBlock™ (Cat # 9068 and Cat # 90681) assay buffers. ChonBlock™ eliminates non-specific reactions involved in the indirect ELISA, especially false positive reactions caused by hydrophobic binding of immunoglobulins in sample specimens to ELISA plates as reported in detail (20-22).

## PLATE COATING AND SETUP

| Antigens | IgG | IgA |
|---|---|---|
| *E. coli* (O111:B4) Lipopolysaccharide (LPS) | Red - 6113 | Red - 6114 |
| *E. coli* (O111:B4) | Yellow - 6115 | Yellow - 6116 |
| *P. gingivalis* LPS | Pink - 6117 | Pink - 6118 |
| *P. gingivalis* | Orange - 6119 | Orange - 6120 |
| *Lactobacillus casei* | Purple - 6121 | Purple - 6122 |
| Peptidoglycan Polysaccharide (PG-PS) | Blue - 6123 | Blue - 6124 |
| Salmonella | Green - 6125 | Green - 6126 |
| Yeast Extract | Gray - 6127 | Gray - 6128 |

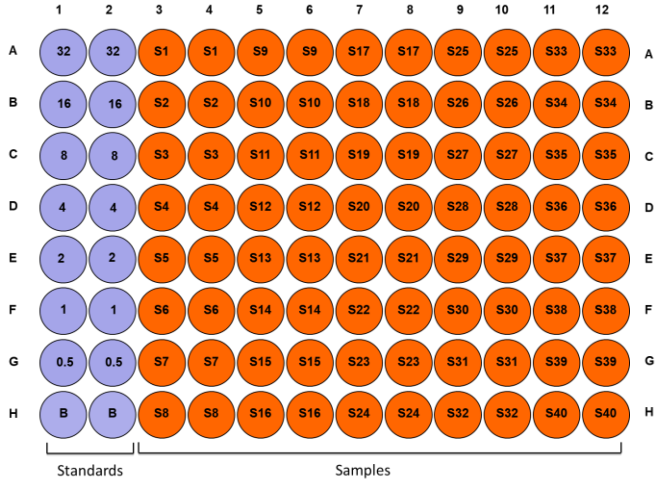
## KIT COMPONENTS

| Item | | Quantity | Amount | Storage |
|---|---|---|---|---|
| Standard Antibody IgG or IgA | *E. coli* LPS (61131 or 61141)<br>*E. coli* (61151 or 61161)<br>*P. gingivalis* LPS (61171 or 61181)<br>*P. gingivalis* (61191 or 61201)<br>*Lactobacillus casei* (61211 or 61221)<br>PG-PS (61231 or 61241)<br>Salmonella (61251 or 61261)<br>Yeast Extract (61271 or 61281) | 1 vial | 32 units, lyophilized | -20°C |
| IgG or IgA Secondary Antibody (peroxidase-conjugated goat polyclonal antibodies) (61133 or 61143) | | 2 vials | 50 µl/vial | -20°C |
| Solution A - Blocking Buffer (61026) | | 1 bottle | 10 ml | -20°C |
| Solution B - Sample/Standard Dilution Buffer (61027) | | 1 bottle | 50 ml | -20°C |
| Solution C - Secondary Antibody Dilution Buffer (61025) | | 1 bottle | 20 ml | -20°C |
| TMB Solution (90023) | | 2 vials | 0.2 ml/vial | -20°C |
| Chromogen Dilution Buffer (90022) | | 1 bottle | 20 ml | -20°C |
| Stop Solution - 2N Sulfuric Acid (9016) | | 1 bottle | 10 ml | -20°C |
| Wash Buffer, 20X (9005) | | 1 bottle | 50 ml | -20°C |
| Antigen coated 8-Well Strips | | 12 each | 8-well strips | -20°C |

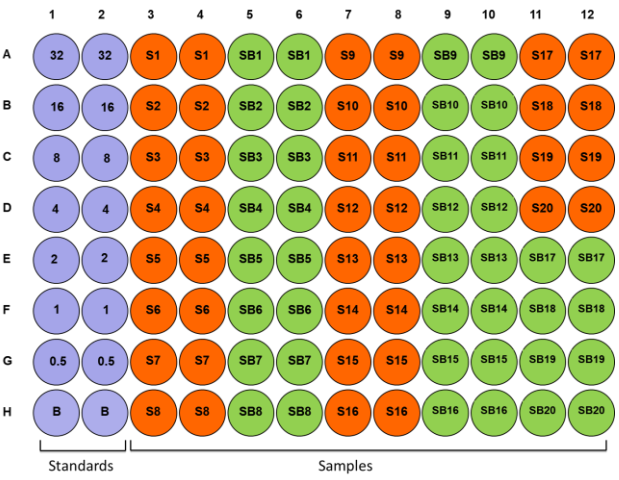
## PLATE MAPPING

Map the plate based on the number of samples and sample dilution. For example, if sample dilution is more than 1:1,000, it is not necessary to run antigen uncoated wells, but if sample dilution is less than 1:1,000, it is necessary to run antigen uncoated wells to determine the background noise (BG) reaction OD values of individual samples.

Standard Layout of Antigen-coated Plate




Standard Layout of Antigen-coated and Uncoated Plate



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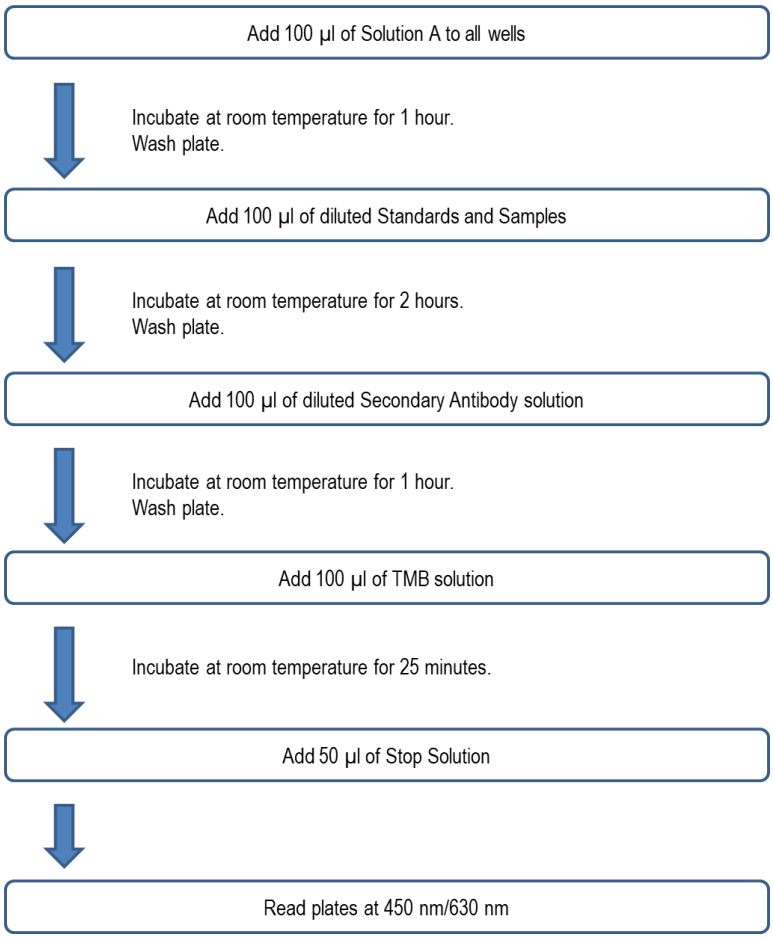
## ASSAY OUTLINE




## NOTES BEFORE USING ASSAY

NOTE 1: It is recommended that the standard and samples be run in duplicate.

NOTE 2: Warm up all buffers to room temperature before use.

NOTE 3: Crystals may form in Wash Buffer, 20X when stored at cold temperatures. If crystals have formed, warm the wash buffer by placing the bottle in warm water until crystals are completely dissolved.

NOTE 4: Measure exact volume of buffers using a serological pipet, as extra buffer is provided.

NOTE 5: Cover the plate with plastic wrap or a plate sealer after each step to prevent evaporation from the outside wells of the plate.

NOTE 6: For partial reagent use, please see the assay protocol's corresponding step for the appropriate dilution ratio. For example, if the protocol dilutes 50 µl of a stock solution in 10 ml of buffer for 12 strips, then for 6 strips, dilute 25 µl of the stock solution in 5 ml of buffer. Partially used stock reagents may be kept in their original vials and stored at -20ºC for use in a future assay.

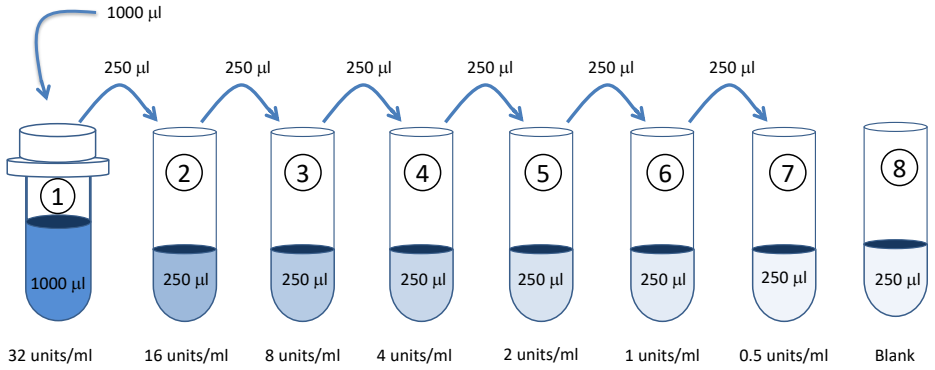
NOTE 7: This kit contains animal components from non-infectious animals and should be treated as potential biohazards in use and for disposal.

## ASSAY PROCEDURE

1. **Add Blocking Buffer**: Add 100 µl of the Blocking Buffer (Solution A) to each well and incubate for 1 hour at room temperature.

   NOTE: If a sample with a dilution of 1:1,000 or less is assayed, antigen non-coated strips should be used. Solution A must be added to the non-coated wells without prior washing because any contaminants in the vessel containing the washing buffer will bind to the strips. For example, add 100 µl of Solution A to the antigen-coated strips (S1) and the corresponding uncoated strips (SB1). Incubate for 1 hour at room temperature.

2. **Prepare Standard Dilutions**: Dissolve one vial of standard (32 units/vial) with 1 ml Standard/Sample dilution buffer (Solution B) to make a 32 units/ml stock standard solution. Prepare standard serial dilutions by mixing 250 µl of the stock standard solution with 250 µl of Solution B (16 units/ml). Repeat this procedure to make 8, 4, 2, 1, and 0.5 units/ml standard solutions for a total of 7 serial standard dilutions. Keep the remaining 32 units/ml stock standard solution at -20°C for future assays.




3. **Prepare Sample Dilutions**: Add 10 µl of serum sample to 990 µl of Solution B (1:100) and keep it as a stock solution for future assays. Then, further dilute the sample with Solution B depending on the antibody levels. For example, take 50 µl of the sample stock solution and mix with 450 µl of solution B to make a 1:1,000 dilution. If it is necessary to assay antibodies at a low dilution (less than 1:1,000) due to low antibody levels, antigen uncoated control strips will be necessary. Please contact support@chondrex.com for more information.

   NOTE 1: Chondrex, Inc. recommends running a preliminary assay using various dilutions of sera (1:1,000, 1:4,000, 1:16,000) in order to determine the optimal dilution of your samples, especially before assaying a large number of samples.

   NOTE 2: The following table shows reference antibody levels from 136 Japanese patients with different diseases. The antibody levels will depend on patient groups.

| Antigens | IgG (x1000 units/ml) | | IgA (x1000 units/ml) | |
|---|---|---|---|---|
| | Average | STEDV | Average | STEDV |
| *E.coli* | 38.7 | 58.1 | 15.9 | 37.9 |
| *P .gingivalis* | 12.4 | 22.7 | 4.7 | 4.9 |
| *Lactobacillus casei* | 30.4 | 62.2 | 5.3 | 11.0 |
| Salmonella | 43.0 | 49.3 | 19.4 | 43.8 |
| Yeast Extract | 51.2 | 90.3 | 6.4 | 9.9 |
| *E.coli*-LPS | 2.6 | 3.4 | 2.1 | 2.8 |
| PG-LPS | 48.1 | 71.5 | 2.0 | 2.1 |
| PG-PS | 160.0 | 154.0 | 16.6 | 18.8 |

4. **Dilute Wash Buffer**: Dilute 50 ml of 20X wash buffer in 950 ml of distilled water (1X wash buffer). Wash the plate with 1X wash buffer at least 3 times using a wash bottle with manifold or an automated plate washer. Empty the plate by inverting it and blotting on a paper towel to remove excess liquid. *Do not allow the plate to dry out*.

5. **Add Standards and Samples**: Add 100 µl of standards, Solution B (blank), and samples to wells in duplicate according to the desired layout. Incubate at room temperature for 2 hours.

   NOTE: If a sample with a dilution of 1:1.000 or less is assayed, add 100 µl of the diluted samples to the antigen-coated strips (S1) and the corresponding uncoated strips (SB1).

6. **Wash**: Wash the plate with 1X wash buffer at least 3 times using a wash bottle with manifold or an automated plate washer. Empty the plate by inverting it and blotting on a paper towel to remove excess liquid. Do not allow the plate to dry out.

7. **Add Secondary Antibody**: Dilute one vial of Secondary Antibody with 10 ml of Secondary Antibody Dilution Buffer (Solution C). Add 100 µl of secondary antibody solution to each well and incubate at room temperature for 1 hour.

| Strip # | 2nd Antibody (µl) | Solution C (ml) |
|---|---|---|
| 2 | 8 | 1.7 |
| 4 | 17 | 3.3 |
| 6 | 25 | 5.0 |
| 8 | 33 | 6.6 |
| 10 | 42 | 8.2 |
| 12 | 50 | 10.0 |

8. **Wash**: Wash the plate with 1X wash buffer at least 3 times using a wash bottle with manifold or an automated plate washer. Empty the plate by inverting it and blotting on a paper towel to remove excess liquid. Do not allow the plate to dry out.

9. **Add TMB**: Use new tubes when preparing TMB. Dilute one vial of TMB with 10 ml of Chromogen Dilution Buffer just prior to use. Add 100 µl of the TMB solution to all wells immediately after washing the plate and incubate at room temperature for 25 minutes.

| Strip # | TMB (µl) | Chromogen Dilution Buffer (ml) |
|---|---|---|
| 2 | 34 | 1.7 |
| 4 | 66 | 3.3 |
| 6 | 100 | 5.0 |
| 8 | 132 | 6.6 |
| 10 | 164 | 8.2 |
| 12 | 200 | 10.0 |

10. **Stop**: Add 50 µl of 2N sulfuric acid (Stop Solution) to each well.

11. **Read Plate**: Read the OD values at 450 nm (a 630 nm filter can be used as a reference) within 5 minutes after added Stop Solution. If the OD values of the samples are greater than the OD values of the highest standard, re-assay the samples at a higher dilution.

## CALCULATING RESULTS

1. Average the duplicate OD values for the standards, blanks (B) and test samples in uncoated wells and coated wells.

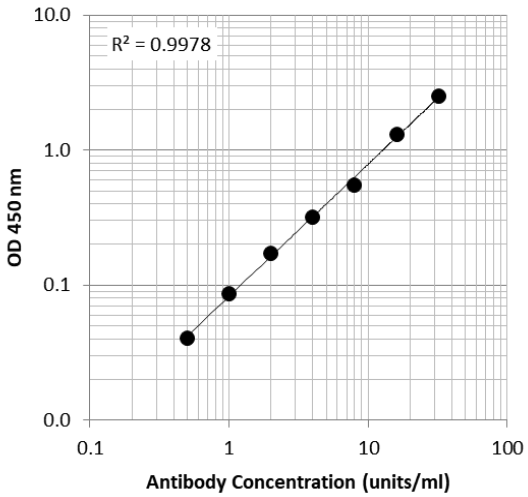
2. Subtract the blank (B) values from the averaged OD values of the standards and test samples in uncoated wells and coated wells.

   NOTE: Individual antigens have unique background values. Therefore, blank wells should be used for each different antigen.

3. Subtract the OD values of samples tested in uncoated wells (background values) from their counterpart OD values in coated wells from Step 2 to eliminate values associated with non-specific reactions.

4. Plot the OD values of standards against the units/ml of antibody standard. Using a log/log plot will linearize the data. Figure 1 shows a representative experiment where the standard range is from 0.5 to 32 units/ml. The units/ml of antibody in test samples can be calculated using regression analysis.

Figure 1 - A Typical Standard Curve for a Human-Anti-Bacteria and Toxin Antibody ELISA Kit




## VALIDATION DATA

Table 1 - Reproducibility data for the Anti-*E. coli* (O111:B4) LPS Antibody ELISA Kit

| | IgG (6113) | | | IgA (6114) | | |
|---|---|---|---|---|---|---|
| **Test At** | **1 unit/ml** | **4 units/ml** | **16 units/ml** | **1 unit/ml** | **4 units/ml** | **16 units/ml** |
| Intra-Assay CV (%) | 3.2 | 6.2 | 7.2 | 8.8 | 5.0 | 3.3 |
| Inter-Assay CV (%) | 3.7 | 6.3 | 6.5 | 9.8 | 9.3 | 4.2 |
| Spiking Test* | 97% | 109% | 95% | 103% | 97% | 94% |

Table 2 - Reproducibility data for the Anti-*E. coli* (O111:B4) Antibody ELISA Kit

| | IgG (6115) | | | IgA (6116) | | |
|---|---|---|---|---|---|---|
| **Test At** | **1 unit/ml** | **4 units/ml** | **16 units/ml** | **1 unit/ml** | **4 units/ml** | **16 units/ml** |
| Intra-Assay CV (%) | 4.0 | 4.7 | 1.2 | 1.1 | 3.8 | 5.3 |
| Inter-Assay CV (%) | 9.8 | 8.0 | 6.0 | 3.8 | 2.0 | 10.0 |
| Spiking Test* | 95% | 107% | 90% | 88% | 94% | 91% |

Table 3 - Reproducibility data for the Anti-*P. gingivalis* LPS Antibody ELISA Kit

| | IgG (6117) | | | IgA (6118) | | |
|---|---|---|---|---|---|---|
| **Test At** | **1 unit/ml** | **4 units/ml** | **16 units/ml** | **1 unit/ml** | **4 units/ml** | **16 units/ml** |
| Intra-Assay CV (%) | 2.5 | 8.8 | 2.8 | 8.9 | 1.1 | 1.9 |
| Inter-Assay CV (%) | 9.0 | 5.8 | 7.7 | 9.9 | 4.5 | 6.3 |
| Spiking Test* | 94% | 96% | 95% | 105% | 108% | 105% |

Table 4 - Reproducibility data for the Anti-*P. gingivalis* Antibody ELISA Kit

| | IgG (6119) | | | IgA (6120) | | |
|---|---|---|---|---|---|---|
| **Test At** | **1 unit/ml** | **4 units/ml** | **16 units/ml** | **1 unit/ml** | **4 units/ml** | **16 units/ml** |
| Intra-Assay CV (%) | 7.3 | 1.9 | 2.8 | 3.3 | 5.3 | 9.0 |
| Inter-Assay CV (%) | 6.0 | 6.3 | 9.0 | 10.9 | 1.5 | 5.8 |
| Spiking Test* | 95% | 95% | 110% | 91% | 89% | 91% |

Table 5 - Reproducibility data for the Anti-*Lactobacillus casei* Antibody ELISA Kit

| | IgG (6121) | | | IgA (6122) | | |
|---|---|---|---|---|---|---|
| **Test At** | **1 unit/ml** | **4 units/ml** | **16 units/ml** | **1 unit/ml** | **4 units/ml** | **16 units/ml** |
| Intra-Assay CV (%) | 3.9 | 7.3 | 1.3 | 6.0 | 2.6 | 0.6 |
| Inter-Assay CV (%) | 9.2 | 4.4 | 7.3 | 6.0 | 9.2 | 9.4 |
| Spiking Test* | 92% | 94% | 98% | 96% | 102% | 93% |

Table 6 - Reproducibility data for the Anti-PG-PS Antibody ELISA Kit

| | IgG (6123) | | | IgA (6124) | | |
|---|---|---|---|---|---|---|
| **Test At** | **1 unit/ml** | **4 units/ml** | **16 units/ml** | **1 unit/ml** | **4 units/ml** | **16 units/ml** |
| Intra-Assay CV (%) | 6.8 | 1.2 | 8.9 | 7.3 | 3.5 | 6.5 |
| Inter-Assay CV (%) | 6.1 | 1.7 | 8.9 | 7.5 | 9.7 | 4.3 |
| Spiking Test* | 108% | 101% | 95% | 94% | 96% | 96% |

Table 7 - Reproducibility data for the Anti-Salmonella Antibody ELISA Kit

| | IgG (6125) | | | IgA (6126) | | |
|---|---|---|---|---|---|---|
| **Test At** | **1 unit/ml** | **4 units/ml** | **16 units/ml** | **1 unit/ml** | **4 units/ml** | **16 units/ml** |
| Intra-Assay CV (%) | 4.2 | 5.0 | 8.0 | 4.9 | 3.6 | 2.9 |
| Inter-Assay CV (%) | 4.6 | 4.0 | 7.8 | 8.4 | 4.8 | 4.0 |
| Spiking Test* | 90% | 91% | 98% | 92% | 91% | 93% |

Table 8 - Reproducibility data for the Anti-Yeast Extract Antibody ELISA Kit

| | IgG (6127) | | | IgA (6128) | | |
|---|---|---|---|---|---|---|
| **Test At** | **1 unit/ml** | **4 units/ml** | **16 units/ml** | **1 unit/ml** | **4 units/ml** | **16 units/ml** |
| Intra-Assay CV (%) | 7.5 | 6.1 | 1.9 | 6.6 | 9.0 | 5.8 |
| Inter-Assay CV (%) | 6.5 | 6.9 | 8.3 | 9.7 | 3.4 | 9.8 |
| Spiking Test* | 110% | 103% | 104% | 95% | 102% | 93% |

* Standards were added with known amounts of antibody and then diluted with Sample/Standard Dilution Buffer to assay antibodies by ELISA.

## TROUBLESHOOTING

For frequently asked questions about assays and ELISAs, please see Chondrex, Inc.'s ELISA FAQ for more information.

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